

Descriptive Title Of Invention

Multi Plane Plumb Level

Background Of The Invention

The carpenters level is an ancient construction device used to assure carpenters and construction workers that the floors, walls, and other items they are installing or erecting in buildings or on land are level. More specifically, the present invention relates to the use of tradesmen for plumbing wall, studs, joists, pipes, fence posts, or anything that must be true vertical and true horizontal. Straight, level planes are an essential measurement in construction. In man's quest for a level foundation, leveling was established by a variety of methods such as water placed in a bowl, measurement via use of string, or by the human eye. More accurate design applications have evolved from these archaic devices and the basic fundamental need for horizontal and vertical measurement. Several patents, such as U.S. Patent Number D397,946, U.S. Patent Number 238,153, and U.S. Patent Number 582,517 are examples of the evolution of the methods to obtain more accurate and reliable determinations of true horizontal and true vertical. In these examples of prior art, there are several embodiments of the carpenters level that depict levels with flat sides, levels that are notched on one end, and levels notched on one or two sides. However, no single device is known (prior to this present invention) that has an (X) shaped body and swivel leveling vials to plumb, post plumb, or level in multiple planes. More specifically, the Multi Plane Plumb Level is equipped with several features that essentially take the carpenters level to the next level.

An example of these differences from prior art is that the Multi Plane Plumb Level, unlike those in prior art, is notched on all four sides (otherwise described as an Interfacing Triangular Design) so that it resists bending. In addition, the almost square shape of the Multi Plane Plumb Level results in it having a low center of gravity, which retards the toppling noted in situations where prior art levels are placed on flat surfaces. The Multi Plane Plumb Level has flip out vials allowing the invention to have a simultaneous 45-degree to 45-degree plumbing capability. This feature is unique to a framing level and is more accurate on the working plane than a bull's eye bubble. This results in the user being able to do "post plumb" and intersecting 45-degree angles without moving (toggling) the level from one plane to the other. These 45-degree vials can be removed, used as a line level, and returned to its position for easy storage and accessibility.

An additional feature of the Multi Plane Plumb Level is the 45-degree (V) groove which allows the level to balance with no support on non-flat objects such as but not limited to piping, round fencing, and apexes. The invention's deep centerline also aids leveling odd angled surfaces. Adhesive magnets on the Multi Plane Plumb Level allow it to adhere to metal surfaces for hands-free maneuverability. In addition, the Multi Plane Plumb Level is equipped with protective end caps comprised of materials such as but not limited to rubber, which allows the invention to resist shock, scratch damage, and electrical conduction.

These features of the Multi Plane Plumb Level result in it being a practical and highly functional evolution of the carpenters level. In essence, the Multi Plane Plumb Level is virtually a one-stop shop for general construction and plumbing purposes. Overall, the Multi Plane Plumb Level embodies features that current rectangular, post, or spirit plumb levels cannot provide and essentially takes the carpenters level to the next level in design and functionality.

Brief Summary Of The Invention

The principle objective of the Multi Plane Plumb Level is to provide a device for use in plumbing or leveling horizontal and vertical planes in a simple, expedient, and precise manner. It is also the intent of the present invention to provide a practical evolution to the common level with its unique functionality and design features. Another objective is to give the user a device with a capability of several devices: a plumb level, a post level, and a carpenters level. The Multi Plane Plumb Level can accomplish the aforementioned objectives since it provides a portable multi-surface, multi-angled measurement device. In essence, the Multi Plane Plumb Level, a multi-plane level that comes in various lengths, is a virtual one-stop shop for general construction and plumbing purposes.

The Multi Plane Plumb Level is formed by a rigid elongated (X) shape or , more specifically, four linear, centrally located, 45-degree intersecting grooves that run the total length of the device. This level has a low center of gravity which retards toppling on flat surfaces noted with prior art levels. Its unique (X) shape resists bending and the level's 45-degree (V) groove allows it to balance on non-flat objects without any support. The 45-degree (V) groove of the Multi Plane Plumb Level aids in leveling odd angled surfaces with its deep centerline. In the vertical direction, two of these identical opposing 45-degree grooves are fitted with flip out bubble vials

that swivel from a locked parallel position, to a dueling 45-degree angle that extends from the standard position. In the horizontal direction, two identical opposing bubble vials are centrally located inside the standard section. In addition, two identically located opposing bubble vials are mounted on a 45-degree angle on the opposing end. These bubble vials provide simultaneous 45-degree to 45-degree plumbing capability which is unique to prior art and is more accurate on the working plane than a bull's eye bubble. These flip out vials can be removed, used as a line level, and returned to its position for easy storage and accessibility. The Multi Plane Plumb Level is also equipped with adhesive magnets that allow it to adhere to metal surfaces for hands-free maneuverability. Lastly, the Multi Plane Plumb Level is equipped with protective end caps made from materials such as but not limited to rubber which result in the invention being able to resist shock, scratch damage, and electrical conduction.

Description Of Drawings

FIG 1 is a horizontal perspective of the Multi Plane Plumb Level embodiment containing (6) tubular leveling bubbles in accordance with present invention;

FIG 2 is the vertical perspective showing the action of the swivel vials in relation to a post or 45-degree planes. The rear is identical;

FIG 3 is an enlarged, fragmentary, cross section perspective of the Multi Plane Plumb Level embodiment as it relates to the mechanics of the dueling swivel vials;

FIG 4 is a fragmentary length perspective of the Multi Plane Plumb Level embodiment as it related to the opposing round 45-degree bubble vials;

FIG 5 is a side top view of the embodiment showing the swivel vial, center mounted magnet stand, center mounted vial, and a circular 45-degree angled bubble vial. The rear is identical;

FIG 6 is a frontal side view of the Multi Plane Plumb Level embodiment. The rear is identical;

Detailed Description Of The Invention

As shown in the drawings, the preferred Multi Plane Plumb Level in accordance to the present invention includes a portable geometrical frame 1

of (X) shape, which is preferably (but not limited to) aluminum or stress-resistant plastic material. The opposing 45-degree grooves of the Multi Plane Plumb Level 7 are exposed as such to snugly hold swivel vials 2 and stationary bubble vials 4 and adhesive magnets 8 which are mounted in the handle molding 9 attached to the middle standard. A swivel pin 10 extends through registered holes in the swivel base 11 to permit rotation of such section relative to the swivel vials. A locking dimple or mechanism 3 in the swivel base engages against the swivel vials in a locked position so that it remains flush with the frame. Protective end caps 13 comprised of materials including but not limited to plastic are mounted on the extreme ends of the standard contouring flush with its (X) shape. The protective end caps results in the invention being able to resist shock, scratch damage, and electrical conduction. The extended (X) shape embodiment and its part are preferably constructed of materials including but not limited to aluminum, rubber, and plastic.

The Multi Plane Plumb Level comes in various lengths including but not limited to 12", 24", 36", 48" and can be described as a longitudinal/horizontal 360-degree plumb level. The design of the invention lends itself to resisting bending and the adhesive magnets allow the Multi Plane Plumb Level to adhere to metal surfaces for hands-free maneuverability. In addition, the almost square shape of the Multi Plane Plumb Level gives the invention a wide stance resulting in it having a low center of gravity, which retards the toppling noted in situations where prior art levels are placed on flat surfaces.

The flip out vials allow the invention to have a simultaneous 45-degree to 45-degree plumbing capability. This feature, unique to a framing level and more accurate on the working plane than a bull's eye bubble, results in the user being able to do "post plumb" and intersecting 45-degree angles without moving (toggling) the level from one plane to the other. These 45-degree vials can be removed, used as a line level (trapeze level line), and returned to its position for easy storage and accessibility. The 45-degree (V) Groove on the Multi Plane Plumb Level allows the level to balance with no support on non-flat objects such as but not limited to piping, round fencing, and apexes. The invention's deep centerline also aids leveling odd angled surfaces. The Multi Plane Plumb Level's use by the construction trade will be advantageous. Overall, the (X) shaped profile gives the user additional surface angles and a wider stance applicable to a multitude of plumb, post plumb, and leveling situations.